Polypodiaceae is dominated among spores. That pollen spectra may reflects dry conditions, when shrub tundra landscapes with periglacial vegetation communities were dominated. The third zone (PZ-3) from 4.7 m to 0.8 m is characterized by the highest concentration of pollen and spores and amount of pollen and spores taxa diversity. Increasing of trees and shrub pollen taxa up to 90% is fixed there. *Pinus s/g Diploxylon* is dominated among that taxa. Poaceae and Cyperaceae are dominated among herbs taxa. Polypodiaceae still dominates in spore group. The pollen spectra of PZ-3 probably reflect the most favorable conditions of Holocene. Summarize pollen results it is possible to conclude that excavated sediments formed during lateglacial and Holocene time. The work was supported by joint grant SPBU-DFG 18.65.39.2017

NORTH-SOUTH DISPERSION VECTOR IN POSTGLACIAL RECOLONIZATION OF EUROPE AND WESTERN SIBERIA IN MICROSCOPIC FRESHWATER CRUSTACEANS: SEARCH FOR EXPLANATIONS

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Cladocera is a very important group of the microscopic animals in continental water bodies (Forró et al., 2008) with a long and complicated evolutionary history (Van Damme, Kotov, 2016). They are well-known models of recent evolutionary biology. Their remains are widely used in the palaeoecological reconstructions (Van Damme, Kotov, 2016). Several genera of the Cladocera became to be models of studies of the invertebrate phylogeographic patterns in continental waters.

Pioneer phylogeographic works concerning the Cladocera have started at the end of the 20th century (Taylor et al., 1998). Recently a new level of such studies is achieved, now the authors try to analyse global phylogeographic patterns in contrast to previous works mainly focused on Europe or North America. Several trans-Eurasian studies were made by our team, with different collaborators. Such studies revealed in several cases (among other patterns) a peculiar pattern in the postglacial dispersion of the cladocerans in European Russia and Western Siberia: from particular northern regions to more southern regions (Xu et al., 2009; Kotov et al., 2016; Bekker et al., 2018). Such pattern is unusual keeping in the mind a great prevalence of the south-north direction in the postglacial recolonization of the Holarctic from southern refugia (Hewitt, 2000). The north-south dispersion was previously discussed only in few other animal groups. It is proposed that they have survived during Pleistocene glaciation cycles in some "cryptic northern refugia" (Stewart, Lister, 2001). In our poster we will try to find explanations of such pattern of recolonization in the Cladocera (Crustacea: Branchiopoda). Among possible explanations, there are hypotheses referring to an unusual hydrologic situation in Pleistocene. Namely, the Weichselian ice sheet was associated with huge proglacial lakes (ice-dammed lakes) whose drainage changed from south-north to a north-south direction (Mangerud et al., 2001; Astakhov, 2006). Such water movement may have enabled dispersal of cladocerans in a southern direction. Our data demonstrate that this region of proglacial lakes may have acted a source for recolonization. But other explanations are also possible.

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PLEISTOCENE CLADOCERA: A REVIEW

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Cladocera is a very important group of the microscopic animals in continental water bodies (Forró et al., 2008). They are well-known models of recent evolutionary biology. It is known that after death, the chitineous remains of some cladocerans (head shield, valves, appendages) are defragmented and preserved in the sediments (Frey, 1964; Smirnov, 2010). There are records of fossil cladocerans from Mesozoic (Smirnov, 1992; Kotov, 2007) and even from Palaeozoic (Smirnov, 1970; Womack *et al.*, 2012) age, although the latter are dubious (Van Damme, Kotov, 2016). But Quaternary subfossils of the Cladocera are better preserved than in previous periods, and much more numerous.

Remains of several groups of the Cladocera are usual in the bottom sediments of large lakes. Because of their high preservation potential in the Holocene deposits, cladocerans are informative in the reconstruction of past aquatic food webs, in which they occupy a key role (Smirnov, 2010). Tens, even hundreds of papers concerning the cladoceran remains from different Holocene cores are published annually.

But the community composition of cladocerans sometimes are unchanged in last 130,000 years (Frey, 1964). In Pleistocene sediments, the cladoceran remains are common, mainly chydorids and bosminids (head shields, valves, postabdomens). If the value of the chydorid remains for such studies is well-known, only recently the daphniid ephippia become to be objects of such detailed works. An unusual, new direction in the studies of Quaternary cladoceran fossils deals with remains associated with excrements (Kirillova et al., 2016a) and hair (Kirillova et al., 2016b) of the "Mammoth fauna".

The aim of this presentation is to make a review of such records and provide some comments on their using in palaeoecological reconstructions.

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